Q. As well as the price section on Page 3 of your speech?

A. Yes. Essentially, yeah.

Q. And I think that same chart appears at Page 5 of your speech; is that correct? I'm sorry, Page 5 of your expert report.

A. Yes.

Q. Did you do anything to update this speech while you were inputting some of the material into your expert report in this case?

A. No.

Q. Looking at Page 1 of your speech on economic considerations of PMA parts, there's a sentence in there where you say, PMA competition which began in the piston aircraft engine market is now spreading.

Why do you believe PMA competition started in the piston market?

A. Why do I believe it did?

Q. Yes.

A. Because piston engines were dominant at the start of PMA competition.

Q. Why were they dominant?

A. Well, there were more of them in service. The economic conditions set that up, really. The -- we're talking when it first started primarily radial engines, Pratt & Whitney, Curtis Wright radial engines that were in service on airlines and DC-6 and DC-7 aircraft.

And as the industry -- as the industry was moving towards turbines, the old original equipment manufacturers showed a reluctance to support the piston engines. And so, therefore, it made part supply difficult to come by, and PMAers moved into that -- that notch.

Q. Are gas turbine engines more complex than piston engines?

A. In some areas, yes. In some areas, no.

Q. In what areas are they more complex?

A. Well, they're just different types of engines. I mean, certain parts are more complex.

There -- you can look at a piston engine and say some engine -- parts in the engine are more complex than others. You can look at a turbine engine and say the same thing.

But for example, a gasket in a turbine engine is neither more or less complex than a gasket in a piston engine.

Q. Do your thoughts on the economic

[Note: Pages 150-157 missing in original document]

So, it is not just a simple matter to -- to set up and get a PMA.

Q. Does that hold true whether it's for identicality or based on test and computation?

A. Yes, it does.

Q. Are there many situations in which test and computation is not economically feasible?

A. It -- it's possible.

Q. And why is that?

A. Well, test and computation requires, as the -- as the name implies, doing a set of tests on the product to develop your design data. And it implies that you have to do computations.

And so, depending on the cost of that, you measure the cost of your investment in that product versus whatever return that you're going to get from future sales.

So, if the cost is -- is far in excess of whatever you would get from sales, you wouldn't want to do that.

Q. On Page 6 of your speech, there is a section on identicality.

A. Uh-huh.

Q. And you make the statement that the real cost exposure in the use of identicality can be potential legal costs.

A. Yes.

Q. What lawsuits are you aware of personally related to that issue?

A. Well, when an OEM or a type certificate holder sees the word "identicality," they immediately assume that their design data was appropriated or taken without permission or in some illegal manner.

And so, what they usually end up doing is they end up suing the PMA manufacturer. Ideally, they sue him when he's small and just getting started, and that way, that -- whether or not the -- the legal challenges holds up, they can bleed the -- bleed the PMA supplier.

Q. What lawsuits are you personally aware of in which this has occurred?

A. When we had litigation with Continental and Lycoming.

Q. And that was your Superior Air Parts

A. Yes.

Q. -- litigation?

A. Yes.

Q. Are you aware of any other lawsuits?

A. Oh, there were other lawsuits. Lycoming sued a small company called Precision Air Parts back in the -- back in the '80s.

It's -- it's a very common technique for -- for OEMs and type certificate holders to sue PMA holders who get their approvals by identicality.

Q. Is that an opinion based on anecdotal information? What is your source for that information?

A. Experience. That's what I've seen happen in the industry.

Q. So, other than the Teledyne litigation, and then, the Lycoming litigation, what other litigation do you base that statement on?

A. I've seen Pratt has litigated against Odco (phonetic). Lycoming has litigated against Precision. There's been a number of litigations.

I'm not as familiar with all of the ones that take place in the turbine industry, But I do know there's been litigation in that area, also.

Q. So, all the litigation that you're familiar with relates to the piston engine industry?

A. That I'm directly familiar with, yes.

Q. Turning to Page 8 of your report -- or, I'm sorry, of your speech ...

A. (Complying.) Yes.

Q. You again mention some of the litigation.

Is this litigation, again, related to the piston engine industry?

A. Yes.

Q. And you don't have any familiarity with the litigation ongoing in the gas turbine industry?

A. Well, I know that there has been litigation in the gas turbine business, and stuff, but I'm not involved specifically in any of it other than the current litigation.

Q. What is the extent of your knowledge related to the gas turbine engine industry?

A. Just knowing what goes on in the industry.

Q. How do you know what goes on in the industry?

A. What's reported in the news, what's reported in various seminars, litigation filings.

Q. You state that OEMs have become far better at establishing and protecting their trade secrets.

What do you mean by that?

A. Well, it's my impression that -- in later years, that OEMs have -- have done a better job of starting from scratch and protecting their -- their proprietary rights and trade secrets.

Early on in the industry, I think there was probably little reason to worry about protecting those trade secrets, because nobody was using the data but them.

Q. So, is litigation a part of protecting that trade secret?

A. Yes, it could be.

Q. And if it's a trade secret, how would a PMA applicant obtain that information for purposes of an identicality?

A. Well, if it's a trade secret and it's protected, they probably couldn't.

But if it's a trade secret, or claimed to be a trade secret, and it's really not, if it, for example, belongs to the government, if it's available through Freedom of Information Act or government availability, if it's published and is out in the public domain, then, the material's out there to be used.

Q. Is there anything in this speech and the PowerPoint that accompanies it -- is there anything in there that correlates to anything that Rolls-Royce is doing with respect to the Model 250 engine?

A. I don't know that. It could be.

Q. You have no empirical evidence or data to correlate anything in this speech and PowerPoint to Rolls-Royce and the Model 250 engine?

A. All I've read is the complaint and counterclaim, and it does appears that there are a number of same issues that are raised in -- in those two that are similar to the pattern that's been followed in the industry.

But I don't have any specific information, because all I have is the allegations of the complaint and the counterclaim.

MS. MOTE: For the record, I'd just like to make the speech and PowerPoint Exhibits 218 and 219.

(The Court Reporter marked documents for identification as Deposition Exhibits No. 218 and 219.)

Q. Turning to Tab No. 5 of the binder of your documents ...

A. (Complying.) Uh-huh.

Q. Can you just tell me where you got this document or where you obtained this information?

A. I obtained it off of the internet, off of a news reporting service, and I did not write down the source of the document when I printed it off.

Q. So, that was just a news story?

A. It was a -- yes, it was a news story report from a ...

Q. It refers in the first sentence to the association.

Is it possible that this article came from either MARPA or ARSA?

A. It's very possible.

Q. You just don't recall?

A. I don't recall. And when I went back to research for the source of the document, I couldn't find it easily, so I don't -- I don't know. But it does say, association.

Q. Turning to Tab No. 7 of that binder ...

A. (Complying.)

Q. Can you explain to me what that document is?

A. It's just -- it's a document on the availability of information.

Q. Who created this document?

A. You know, I don't know. I don't know who did that.

Q. Where did you obtain this document?

A. Off of the internet.

This actually, probably, came -- it's got the Whitlow letter attached to the back of it. It probably is an ARSA document.

Q. Do you know who wrote this document?

[Note: Pages 166-177 missing in original document]

Q. Was it true only with respect to piston engines at that time?

A. It was true to all my experience at that time. I didn't know of any turbine engine litigation that had been successful at that time.

Q. Were you aware of any litigation at all with respect to turbine engines back in 1982?

A. No.

Q. Turning to Page 40 of your testimony, this is actually a copy of the written statement that you provided in addition to your verbal testimony at the hearing.

A. Uh-huh. Page 40?

Q. Yes.

A. (Complying.)

Q. You indicate in the second paragraph some comments about the OEM's proprietary rights in their designs.

Do you believe that trade secrets and patents are the same thing?

A. Trade secrets and patents? No.

Q. Do you have to have a patient to have a trade secret?

A. I don't believe so, but I'm not a lawyer.

Q. And again, none of these statements relating to proprietary rights have anything to do with Rolls-Royce or the Model 250 engine; is that correct?

A. That's correct.

Q. You were testifying here -- or, you were writing here that Superior obtains its designs in entirely legitimate ways.

Do you know how H.E.R.O.S. and Hye-Tech obtain its designs?

A. No.

Q. About three-quarters of the way down, there's a sentence, it is true that the FAA's primary concern is safety. It is true the FAA has no authority to determine proprietary rights.

Do you still believe that to be the case?

A. I'm trying to find out where you said that.

Q. Oh, it is -- it's the third from the bottom.

A. Third paragraph from the bottom?

Q. Uh-huh. The sentence that starts, it is true ...

A. Oh, okay.

Q. Do you believe that still to be the case, that the FAA has no authority to determine proprietary rights?

A. Yes, I do believe that.

Q. And will the FAA treat data as proprietary whether it's OEM data or PMA data?

A. Yes.

Q. In the second to last paragraph, you made the comment, when I submit a design that I know will produce an identical part to the OEM's part, not infrequently the design is rejected and I'm not told why. I do not know whether the FAA examiner is holding my design and the type certificate holder's design up to a light bulb to see if it is identical.

Did you not know at the time how identicality fact-finding was performed?

A. Well, at that time, it could be performed in any number of FAA offices. And when you get a finding back that a draw -- that your application was done, refused, it would say that the design data is not identical, period.

And from that type of information, you can't tell if there's a small difference or a large difference, and you -- again, in the example presented here, you don't know if it's not being deemed identical because it's not the same layout on the page.

Q. And are you familiar now with how FAA exercises or DERs conduct identical fact-finding?

A. I know how they do it, yes.

Q. And how do you know how they do it?

A. Because I've gotten PMAs, seen people get PMAs by that manner.

MR. McCONWELL: Can we take about a 2-minute break?

THE VIDEOGRAPHER: We're going off the record. The time is 2:21 P.M..

(AT THIS TIME THERE WAS A BRIEF RECESS TAKEN, AFTER WHICH THE FOLLOWING PROCEEDINGS WERE HAD:)

THE VIDEOGRAPHER: We're back on the record. The time is 2:24 P.M.

[Note: Pages 182-197 missing in original document]

I would do measurements, and stuff.

Q. So, you would be working in the plant with the engineers?

A. I would work with the engineers, yes. Engineer.

Q. Were you qualified to do the actual measurements and other issues for test and computation?

A. I could do them.

Q. Why did you do them instead of the engineer?

A. Well, I didn't do them instead of the engineer. I did them in addition to the engineer. We worked together.

Q. What was his role, then, in the product development?

A. He was the ultimate one to approve the material before it went to the FAA.

And then, he would be the ultimate -- ultimately responsible for the quality control system on the product after it came in the door.

Q. Did you personally participate in the preparation and submission of applications for PMA parts?

A. Yes, I did.

Q. And what was your role in that?

A. I would make sure that we had all of the material together that needed to go into the data package to go to the FAA.

Q. How would you know what needed to be included in the data package?

A. My knowledge of the regulations and the procedures by which one submitted stuff to the FAA.

Q. Did your responsibilities change when you became President in 1985?

A. Quite a bit. I was no longer as hands-on in -- with responsibilities in product development.

Q. What kind of work does Aircraft Technology Corporation do?

A. We designed and produced PMA replacement parts for Continental and Lycoming aircraft engines.

Q. What were your responsibilities and day-to-day duties as President of Aircraft Technology?

A. Basically, at Aircraft Technology, I did just about everything. We were -- we were a very small company. I did almost all of the design work, the -- almost all of the CAD drafting work. I selected the products, found vendors and even worked in the quality control department and warehouse.

Q. And did you personally participate in the preparation and submission of applications for PMA parts?

A. I did.

Q. And were those for piston engines?

A. Yes.

Q. Have you ever worked on any projects involving parts for or the repair of the Model 250 engine?

A. No.

Q. Have you ever seen a Rolls-Royce part drawing or specification related to the Model 250 engine?

A. Not that I remember.

Q. Have you ever seen a PMA manufacturer's part drawing or specification related to the Model 250 engine?

A. Not that I remember.

Q. Have you ever seen a data package submitted by a shop for approval of PMA parts related to the Model 250 engine?

A. No.

Q. Have you ever, yourself, submitted a PMA application for a Rolls-Royce Model 250 engine part?

A. No.

Q. Are you a member of any trade organizations?

A. No, not now.

Q. I believe you testified earlier that you have never testified as an expert witness before; is that correct?

A. That's correct.

Q. So, the H.E.R.O.S. and Hye-Tech case is the first case in which you've been retained as an expert?

A. That would be true.

Q. Do you subscribe to any professional journals or publications that would relate to the subject matter of what you've testified to today?

A. I receive almost all of the -- all of the journals, all of the newsletters, all of the publications with regard to the industry and PMA.

End of Document

2009 WL 6653377 (N.D.Tex.) (Expert Report and Affidavit)
United States District Court, N.D. Texas.

ROLLS-ROYCE CORPORATION, Plaintiff,

v.

H.E.R.O.S., INC., Heros Kajberouni, Hye-Tech Manufacturing, LLC., Defendants.

No. 3:07-CV-00739-D.
October 22, 2009.

Expert Report prepared of Charles B. Dedmon

Case Type: Aviation >> N/A
Case Type: Unfair Competition & Business Practices >> Other Unfair Competition & Business Practices
Jurisdiction: N.D.Tex.
Name of Expert: Charles B. Dedmon
Area of Expertise: Engineering & Science >> Aviation/Aerospace Engineer

Representing: Defendant

History and Background

The Federal government has regulated the manufacture of aircraft, aircraft engines and replacement parts for aircraft and engines since the birth of civil aviation in the United States. The Air Commerce Act of May 20, 1926, was the cornerstone of the Federal government's regulation of civil aviation. This landmark legislation was passed at the urging of the aviation industry, whose leaders believed the airplane could not reach its full commercial potential without Federal action to improve and maintain safety standards. The Federal Aviation Administration's (FAA) current mission statement reflects that commitment:

Our mission is to provide the safest, most efficient aerospace system in the world. [1]

The FAA as it is constituted today is the result of several transformations as the agency grew with the civil aviation industry. Beginning as the Aeronautics Branch of the Commerce Department, in 1938, the Civil Aeronautics Act transferred the Federal civil aviation responsibilities from the Commerce Department to a new independent agency, the Civil Aeronautics Authority (CAA). The Federal Aviation Act of 1958 transferred CAA's functions to a new independent body, the Federal Aviation Agency (FAA) that had broader authority and entrusted safety rulemaking to the new FAA.

In 1966, Congress authorized the creation of a cabinet department that would combine major Federal transportation responsibilities. This new Department of Transportation (DOT) began full operations on April 1, 1967. On that day, FAA became one of several organizations within DOT and received its current name: Federal Aviation Administration (FAA).

The FAA is responsible for the safety of civil aviation. As a part of that responsibility, the FAA issues and enforces regulations and minimum standards covering manufacturing, operating, and maintaining aircraft. This responsibility naturally extends to regulating replacement parts for aircraft and engines.

"...It has long been a practice of the FAA to provide a Parts Manufacturer Approval (PMA) for parts produced under the provisions of Sec 21303 (and its predecessor provisions of the CARs [Civil Air Regulations]). The parts so produced have always been known as FAA-PMA parts and reference to FAA-PMA parts are contained in other parts of the regulations."[2]

Parts Manufacturer Approval

All parts used in the manufacture or repair of an aircraft engine or propeller used in civil aviation in the United States must meet the airworthiness requirements of the Federal Aviation Regulations (FARs).[3] Parts Manufacturer Approval (PMA) is a combined design and production approval far modification and replacement parts. The FARs, in § 21.303, are very specific about the procedures to produce an approved replacement or modification part:

§ 21303 Replacement and modification parts.

(a) Except as provided to paragraph (b) of this section, no person may produce a modification or replacement part for sale for installation on a type certificated product unless it is produced pursuant to a Parts Manufacturer Approval issued under this subpart.

(b) This section does not apply to the following:

(1) Parts produced under a type or production certificate.

(2) Parts produced by an owner or operator for maintaining or altering his own product.

(3) Parts produced under an FAA Technical Standard Order.

(4) Standard parts (such as bolts and nuts) conforming to established industry or U.S. specifications.

The FARs are clearly written to show that all replacement parts, regardless of approval method must meet the same airworthiness requirements:

§ 21.303

(d) An applicant is entitled to a Parts Manufacturer Approval for a replacement or modification part if--

(1) The Administrator finds, upon examination of the design and after completing all tests and inspections, that the design meets the airworthiness requirements of the Federal Aviation Regulations applicable to the product on which the part is to be installed: and

(2) He submits a statement certifying that he has established the fabrication inspection system required by paragraph (h) of this section.

(c) Each applicant for a Parts Manufacturer Approval must allow the Administrator to make any inspection or lest necessary to determine compliance with the applicable Federal Aviation Regulations.

An applicant for a PMA must meet two requirements, design approval and establishment of a fabrication inception system in accordance with the FARs.

To apply for design approval, the applicant must submit the following to the FAA:

1. Drawings and specifications necessary to show the configuration of the part.

2. Information on dimensions, materials, and processes necessary to define the structural strength of the part.

3. Test reports and computations necessary to show that the design of the part meets the airworthiness requirements of me Federal Aviation Regulations applicable to the product on which the pert is to be installed, unless me applicant shows that the design of the put is identical to the design of apart that is covered under a type certificate, If the design of the part was obtained by a licensing agreement, evidence of that agreement must be furnished.

There are only two (2) basic ways that a PMA applicant may show that their part design meets compliance 10 the applicable airworthiness standards;

1. The applicant shows that the design of their part is identical to the design of a part covered under a type certificate;[4] or

2. The applicant shows through tests and computations that the design of their part meets the airworthiness standards applicable to the product on which the part is installed.[5]

Some contusion exists as to exactly what a showing of "identicality" means. The FAA may, on an application for design approval based on identicality, require additional tests or analyses to demonstrate the airworthiness of the part. The requirement of these tests does not change the basis of the PMA approval from identicality.

Identicality

When an Applicant requests PMA on the basis of identicality the ACO (Aircraft Certification Office) may determine that additional tests or analyses are requited to demonstrate that the airworthiness of the part is not altered by the manufacturing process, inspection and test procedures as performed by the Applicant These additional tests and analyses found necessary to make a finding of identicality and to grant design approval, do not change the basis of the PMA approval from identicality to test and computation. If the results of these additional tests and analyses are such that the ACO finds that the produced PMA part is not identical to the type certified part, the ACO must reject the PMA application. The Applicant may then elect to reapply for PMA on the basis of test and computation.[6]

Thus "identicality" in terms of FAA design approval does not mean the design data must be a photographic copy but, instead, that the design must be "identical" in form, fit and function to the design data of a type certificated product. The determination of whether the requirement of additional tests and analyses changes the approval basis from identicality remains with the FAA.

In summary.

• There are two basic ways that a PMA Applicant can show that their part design meets compliance to the applicable airworthiness requirements, identicality or test and computation.

• The FAA may require additional tests or analyses to make a finding of identicality, nevertheless the basis of the PMA approval remains identicality *until the FAA determines otherwise*.[7] (emphasis supplied)

Competition and Economic Considerations of PMA Farts

Certification and production of parts under the PMA regulations has occurred since at least the 1930's. The PMA process did not become controversial until the late 1950's when the PMA regulations were used by some companies to produce replacement

parts for existing type certificated products - in competition with the type certificate holder.[8] (*In the civil aviation industry the type certificate holder Is commonly referred to as the Original Equipment Manufacturer or OEM. This nomenclature is used interchangeably in this document.*)

Market conditions were ideal for this sort of competition. OEMs were in the process of switching from the manufacture and support of radial piston engines to jet engines for the emerging airline industry. The piston engines in service were not as profitable for aftermarket parts sales because significant quantities of replacement parts were being released as military surplus by the United States government as the supply of military surplus decreased, there was an incentive fins alternative suppliers to produce approved replacement parts under the FAA regulations. The OEMs had previously seen high profit margins in the replacement parts market (see Economic Structure below), but were unenthusiastic to support what they determined to be a declining market. In addition, there were a number of qualified suppliers to the OEMs that saw their business decline significantly as the OEMs converted to turbine manufacturing. Thus the conditions for growth of PMA suppliers were as follows:

- FAA regulations wore in place for PMA replacement parts
- There were high profit margins on replacement parts
- Qualified suppliers for these parts were not being used
- OEMs were not enthusiastic to support this market segment

Economic Structure of the Market

Prior to the introduction of PMA replacement parts competition, aircraft engine OEMs experienced a classic controlled aftermarket scenario.

- Sales to airframe manufacturers were highly competitive with the market dominated by only a few true competitors. For example, Textron Lycoming and Teledyne Continental competed fiercely to install their engines in type certificated airframes built by companies like Cessna, Beechcraft and Piper, Pratt & Whitney, General Electric, Rolls-Royce and a few others competed for turbine (including turboprop and turboshaft) sales to major airframe companies like Douglas, Boeing and Lockheed, To a large extent, sales were dependent on pricing and gross margins on sales were low.

- Once an engine was installed in the airframe, aftermarket service and spare parts sales went largely back to the OEM. There was competition for overhaul and repair from independent overhaul facilities and airline maintenance operations, Sales for the engine OEM depended on the volume of engines sold to airframe manufacturers and OEM policy toward overhaul and repair. Gross margins were higher than margins on OEM sales.

- The market for engine spare parts was essentially monopolistic. Whether maintenance and overhaul was done by the airline, independent shop or the engine OEM, there was only one source for replacement parts - the OEM. The market was totally dependent of the volume of engines sold to airframe manufactures and the time of operation of the engine, Gross margins on replacement parts sales were the highest of all market segments.

TABLE

PMA aftermarket suppliers generally began by producing less complex parts for engines that were being used less and less as technology advanced. With time and experience, PMA suppliers began to supply more complex products and to supply products for ourrent production engines. This evolvement in market participation was met by fierce competition.

OEM Competitive Reaction to PMA Suppliers

OEM aircraft engine manufacturers have consistently met PMA competition with fierce reaction. Bach of the OEMs has used one or more of the following techniques as they fought PMA competition and with time have increased the subtlety of their methods:

1. The Disparagement Technique

a. Telling potential customers, suppliers and even the FAA that PMA suppliers are in the business for a "free ride" having made no investment in engineering expertise or quality equipment, even though the Federal Aviation Administration has determined that they have met essentially the same airworthiness requirements as the OEM.

b. Telling potential customers, suppliers, and even the FAA that PMA suppliers are only interested in spare parts, not servicing &e entire engine or providing ongoing product support.

c. Telling potential customers, suppliers, and even me FAA that PMA suppliers are "picking the raisins out of the coke" by manufacturing only fast moving replacement parts, leaving the OEM to furnish slower moving items.

d. OEMs refer to PMA replacement parts, approved by me Federal Aviation Administration, both verbally I and in writing using such disparaging terms as "bogus", "will-fir", "ersatz", "look-a-like", "unsafe", "obsolete", "unauthorized", and "imitation".

2. The Administrative Barrier Technique

a. Refusing or delaying the furnishing of information to the FAA that the FAA has full right to have, in order to prevent the FAA from following its responsibility to make a determination on whether a PMA applicant has met airworthiness standards.

b. Providing inaccurate information to the FAA as to the technical and/or engineering qualifications of a PMA applicant.

3. The Price and Bundling Technique

a. The OEM makes selective price reductions on parts for which there is PMA competition while raising disproportionately parts for which the OEM has no competition.

b. The OEM sells parts only in "bundles" consisting of some parts for which there is PMA competition and some parts for which there is no competition. By refusing to sell any of the parts in the "bundle" separately, the OEM precludes the purchaser from buying PMA parts, even if they are more economical.

c. The OEM raises the price on individual pints, but reduces the price on "bundles", thereby making it uneconomical for a customer to buy a combination of PMA and OEM parts.

4. The "Change-the-Part-Number" Technique

The OEM changes put numbers of replacement parts even though there is little, if any, change in the part design. This causes the customer to want the latest part number, even when there is no significant difference in the part. The OEM has an easier time in providing part number changes to the FAA than does the PMA holder, who must reapply from the start for a new PMA.

5. The "Mandatory" Service Bulletin Technique

The OEM publishes "Mandatory" service bulletins to remove certain parts at a specified time and to replace those parts with items available only from the OEM. While, in general, service bulletins and service instructions are not mandatory unless referenced in an Airworthiness Directive, the OEM can overstate the importance of an issue by using the word "mandatory" in the title. The intentional misuse of the term "mandatory" is to cause the removal of a competitive PMA part, prevent a PMA part from being installed, or prevent a repair authorized by the FAA but not sanctioned by the OEM.

6. The Restricted ICA Technique

Instructions for Continued Airworthiness (ICA) are documentation that gives instructions and requirements for the maintenance that is *essential* to the continued airworthiness of an aircraft, engine, or propeller.[9] (emphasis supplied)

ICAs normally consist of maintenance and overhaul manuals, service bulletins and letters, any other documentation that is necessary to maintain a certified product in a condition in which they can be operated safely for their intended purpose. The product shows its continued airworthiness when it meets its type design and is in a condition for safe operation. The FAA requirements for ICAs are found in FAR 21:

§ 21.50 Instructions for continued airworthiness and manufacturer's maintenance manuals having airworthiness limitations sections.

(c) The holder of a design approval, including either the type certificate or supplemental type certificate for an aircraft, aircraft engine, or propeller for which application was made after January 28, 1981, shall furnish at least one set of complete Instructions for Continued Airworthiness, to the owner of each type aircraft, aircraft engine, or propeller upon its delivery, or upon issuance of the first standard airworthiness certificate for the affected aircraft, whichever occurs later. The Instructions must be prepared accordance with §§23.1529, 25.1529, 25.1729, 27.1529, 29.1529, 31.82, 33.4, 35.4, or part 26 of this subchapter, or as specified in the applicable airworthiness criteria for special classes of aircraft defined in §21.17(b), as applicable. Thereafter, the holder of a design approval must mate those instructions available to any other person required by this chapter to comply with any of the terms of those instructions. In addition, changes to the Instructions for Continued Airworthiness shall be made available to any person required by this chapter to comply with any of those instructions.

Certain. OEMs have restricted the distribution of ICA for their product in order to control the market for repair and maintenance. They make the ICAs available only to certain facilities or at exorbitant prices.

The FAA has indicated that refusal to supply ICAs may be an artificial obstacle to ensuring (each aircraft) is maintained in an airworthy condition. OEMs have attempted to hide behind technicalities to refuse to furnish ICAs, putting their own competitive interest above aviation safety, "... refusal to provide ICA, while technically not a violation, is inconsistent with the objectives of §21.50(b) and is not in the best interests of aviation safety.[10]

Rolls-Royce is one of the companies that have refused to make available ICAs for its type certificated products. A FAR Part 13 Formal Complaint against Rolls-Royce for failure to supply ICA was filed on November 23, 2005.

How PMA Applicants Develop Design Data

The first step in obtaining FAA-PMA is submission of design data for the part. PMA design approval is granted in one of two ways:

1. Identicality

2. Test and Computation

As discussed earlier, the finding of identicality by the FAA does not mean that the product drawing is photographically identical, but that the resultant product will be identical in form, fit and function. This is cleat because:

The FAA may require additional tests or analyses to make a finding of identicality, nevertheless the basis of the PMA approval remains identicality *until the FAA determines otherwise*, [11] (emphasis supplied)

There are many ways to develop design data for a PMA submission for approval based on identicality. Some of the more common ways historically used are as follows: [12]

• Obtaining design data that is in the public domain.

Many cavil aircraft, engines, propellers and other products were initially developed for use by the U.S. military. The civil versions of those products are not significantly different from the military versions. Since the products then developed for the military and paid for by tax dollars, the ownership of the data resides with the U.S. government. In ordering replacement parts, the government reserves the right to solicit bids and proposals from other than the original supplier, (The government has long recognized the hazard of sole source procurement end actively works to create competitive bidding tor all supplies and services, including aircraft and engine parts.)

In more recent years, some contractors have attempted to develop products for the military while negotiating retention of their "proprietary rights" to the design data, Regardless, the government has previously made a significant amount of data available either through the Freedom of Information Ant or direct distribution by government procurement officials.

Copies of drawings, maintenance information containing dimensions, tolerances, and material processing information are regularly found in libraries, particularly those associated with maintenance training facilities and aviation collections.

Maintenance manuals and overhaul/repair information published by the OEM and furnished to pilots, plane owners, overhaul and repair facilities and fixed-base operators under the requirements of the FARs contain information that can also be used in the development of design data, Such information may contain actual dimensions and tolerances or tits and clearances from which part dimensions can be readily calculated.

• From the "actual" manufacturers/subcontractors

Many OEMs for aircraft and aircraft engines use subcontractors to do the actual manufacture of a part. (The FAA defines the holder of the approval as the "manufacturer" and any subcontractor doing manufacturing work as a "supplier") During the design process, the supplier may make significant contributions to the final design because of their specialized manufacturing knowledge. This has lead to competing claims as to who actually holds the proprietary rights, if any exist, to the design date. Often, a supplier who has assisted in (or actually done all of) the design work, that does not get manufacturing orders, will send to design data to other potential customers such as PMA holders.

• Reverse engineering

Reverse engineering is the process of determining the dimensional and structural attributes of a product by examining the product itself. The information derived can be, if desired, used to develop design dare to create a duplicate of the original product Reverse engineering is commonly used in the production of aftermarket parts for automotive, aerospace, or general industrial parts. It is also frequently used for replacement for out-of-production parts.

The following are examples of analyses which may be required to reverse engineer me design data for a part:

• Detailed dimensional analysis, including dimensional variation analysis on a number of parts from different manufacturing lots to determine manufacturing tolerances. Detail dimensional analysis may be conducted by me use of Coordinate measuring machines (CMM) or other techniques such as laser scanning.

• Material analysis including chemical analysis to determine the actual material used. In addition, surface harness and treatment can be determined as can fatigue and other relative properties of the material.

• Analysis of surface roughness, finish, as well as plating or other surface treatments.

The FAA originally anticipated that design data obtained from reverse engineering would not be used for application for an identicality determination.

It should be noted that, as indicated in the notice, the FAA does not expect that designs of parts obtained through reverse engineering would be identical to that of the original Therefore, it is expected that test reports and computations would be necessary for such parts. [13]

However, by clarifying that a determination of identicality might require additional tests and substantiation, the FAA made clear that "identicality" meant identical in form, fit and function, not photographically identical.

The FAA may require additional tests or analyses to make a finding of identicality, nevertheless the basis of the PMA approval remains identicality until the FAA determines otherwise. [14]

To create a part that is identical in form, fit and function is precisely the result to be expected from reverse engineering.

Safety Record of FAA-PMA Parts

The issue of safety of PMA parts hast been an ongoing argument for 30 years, OEMs have, in the past, claimed that PMA parts simply are not as good, hence not as safe as OEM parts. In 1984 and 1988 the FAA commissioned independent studies by COMSIS of safety issues arising from the use of PMA parts. Their findings can be summed up in one sentence:

"There is no evidence of a significant safety problem with PMA parts." [15]

Studied of the FAA's database of Service Difficulty Reports reveal no evidence that there is any difference if safety between the use of PMA parts and OEM parts, Some PMA parts have been the subject of an FAA Airworthiness Directive (AD) as have OEM parts. Examples exist where a PMA part has been subject to an AD while the corresponding OEM part is not. Likewise, multiple examples exist where OEM parts are subject to an AD while the corresponding PMA is not There is no statistical evidence that safety is in any way compromised by the use of PMA parts.

The fact that the safety and credibility of PMA parts has been firmly established in the industry is evidenced by the increased use of PMA parts by major air camera.

There is no statistical evidence, from the FAA or EASA (the European equivalent of the FAA), for safety concerns with PMA parts.

Airlines like United, Delta. Air Canada, Japan Airlines and, most recently, British Airways have struck strategic partnership deals with Heico, reputedly the world's largest independent designer, manufacturer and distributor of FAA-and EASA-approved alternative parts for aircraft and jet engines, American Airlines has a joint venture with the company to manage its alternative

parts, while Lufthansa Technik actively encourages the development and production of PMA parts through its 20 percent stake in Heico.[16]

Perhaps the most supportive statement of the status of PMA parts comes from one of PMAs first and most fierce critics:

Pratt & Whitney took the aviation world by surprise when it announced in February the launch of a new division to manufacture PMA replacement parts for CFM56-3 engines, The CPM56, one of the most popular turbofans, is made by CFM International, a joint venture between France's Snecma and General Electric.

PMA parts are FAA-approved parts made under Parts Manufacturer Approval regulations in FAR 21, and they are usually manufactured by entities other than the OEM. For many years, OEMs such as Pratt & Whitney and General Electric have publicly criticized PMA parts as not being manufactured to the same testing and quality standards as OEM parts, and until now, no major OEM has gone into the business of replicating its competitors' parts.[17]

OPINIONS

Based on the foregoing information, I offer the following opinions;

1. In part because of the Federal Aviation Regulations and their interpretation and application by the Federal Aviation Administration, the United Stales has the largest and the safest civil aviation industry in the world.

2. The FAA has enacted and implemented regulations, particularly Federal Aviation Regulation 21.303, which provides for certification and manufacture of PMA replacement parts for products approved under FAA Type Certificates that meet substantially the same airworthiness requirements as the Type Certificate holder. Issuance of a PMA to a company indicates that FAA has made a positive finding that the applicant can produce a replacement part equal in airworthiness to that of an OEM.

3. H.E.R.O.S., Inc., Hye-Tech Manufacturing, LLC., and Heros Kajberouni (collectively "HERDS") have obtained PMA for a number of replacement parts for type certificated products. Therefore, the FAA has made a positive finding that HEROS meets the airworthiness requirements of the FARs and has demonstrated the ability to produce replacement parts that are equal in airworthiness to an OEM.

4. The information for developing design data for PMA application is available in the public domain. Sources for this public information include, but are not limited to, data for products developed at U.S. government expense, data developed by actual manufacturing sources that have assisted OEMs in developing products, data published in maintenance manuals and service documents.

5. Other companies have obtained PMA for replacement parts for Rolls-Royce engines by the process of identicality, further indicating the availability of the design data in the public domain. These companies include, but are not limited to, Pacific Sky Supply, and Amoni Aviation Services, Inc.

6. The finding of identicality by the FAA does not mean the data is photographically identical to type certificated data but that the product will be identical in form, fit and function.

7. The design data for a part can readily be determined by reverse engineering. This reverse engineering, coupled with a knowledge of industry standard techniques and processes (which are contained in published SAE and AMS specifications) can allow the development of design data for a submission for FAA approval based on rather identicality or test and computation.

8. Documents and data that can be utilized to develop design data are readily available through the Freedom of Information Act or directly from military procurement offices, indicating that the U.S. government represents that this information is in the public domain.

ROLLS-ROYCE CORPORATION (Plaintiff) vs. H.E.R.O.S., INC., HEROS KAJBEROUNI, HYE-TECH MANUFACTURING, LLC. (Defendants) Civil Action No. 3:07-CV-00739-D

Federal Rules of Civil Procedural No. 26 Disclosure

1. The attached report was prepared by:

Charles B. **Dedmon**

Aviation Consulting Group, Inc.

5706 Hagen Court

Dallas, TX 75252

2. Data and other information considered in the preparation of this report, other than those footnoted, include:

a. Federal Aviation Regulations, FAA Orders, FAA Advisory Circulars, FAA Policy statements, and Notices of Proposed Rulemaking. All available at one or more of the following websites:

i. Federal Aviation Administration (*www.faa.gov*)

ii. Aeronautical Repair Station Association (*www.arsa.org*)

iii. Modification and Replacement Parts Association (*www.pmamarpa.com*)

3. Exhibits to Support Opinions:

a. Other than those referenced in the Opinion or in Paragraph 2 above, there are none at this time.

4. Qualifications:

a. See attached Curriculum Vitae.

5. Publication authored in lest 10 years:

a. None other than those seminars noted in the attached Curriculum Vitae.

6. List of Cases where I have testified as an expert witness in the last 4 years:

a. None

7. Compensation to be paid for study and testimony in this case:

a. Billing rate of $175 per hour plus applicable expenses

CHARLES B. DEDMON

Home Address: 5706 Hagen Court

Dallas, TX 75252

EXPERIENCE

AVIATION CONSULTING GROUP, INC. (1998 to date)

Provide consultation on compliance with Federal Aviation Administration regulation* in the areas of product certification, engineering, and manufacturing. In addition, ACG also provides consultation involving product liability Insurance, exposure and litigation.

AIRCRAFT TECHNOLOGY CORPORATION, INC. (1990 - 1998)

Founded AirTech in 1990 and served as its President until its sale in 1998. The company's primary business was designing, engineering, manufacturing, and distributing FAA approved replacement parts for aircraft engines. Sold company on March 31, 1998.

SUPERIOR AIR PARTS, INC. (1969 - 1990)

Held the position of Vice-President with responsibility for marketing, product development, FAA regulatory compliance, product liability insurance matters, and company litigation. Became President upon Superior's acquisition by NEOAX, Inc. in 1985. Activities expanded to include strategic planning and budgeting.

President (1985 - 1990)

• Became president upon acquisition of Superior by NEOAX, Inc. in November, 1885. NEOAX, Inc. was a holding company with 13 subsidiaries.

• Participated in negotiation and sale of Superior to NEOAX.

• Led company from $17 million in sales in 1985 to $34 million in 1989, with commensurate increase in net operating income.

• Established network of company-owned Regional Distribution Centers, with seven (7) domestic locations in addition to Dallas headquarters.

• Established international franchised distribution network, with distributors in Australia, New Zealand, Canada, Mexico, Brazil, South Africa, England, and Denmark.

• Prepared Strategic Plan for Superior within framework of holding company, and developed annual operating plans and budgets.

• Actively involved in sale of company in 1989. Worked with outside financial advisor, The First Boston Corporation, in developing Offering Memorandum and making presentations to potential purchasers. Assisted in final negotiation of sale to acquisition group consisting of HMA, Inc., Vista International, and G.E. Capital Corporation.

Vice-President (1972 - 1985)

• Responsible for marketing activities and product development, including coordination of company activities with the Federal Aviation Administration.

• Was primary coordinator of company's legal activities, including major anti-trust litigation from 1976 - 1981, and regulatory activities with the Federal Aviation Administration.

• Called as industry expert to testify before U.S. House of Representatives sub-committee investigating competition in aviation replacement parts industry.

• Established integrated sales program involving fixed-base operators and aircraft engine overhaul shops, including pricing policies.

• Represented company at major seminars and FAA sponsored clinics, instructing aircraft technicians on latest maintenance techniques.

EDUCATION

Bachelor of Arts (Economics)

Rice University -1965

Master of Business Administration

Southern Methodist University - 1966

Representative sample of speaking engagements:

December 1, 1993 - "The Role of FAA Designees in the PMA Certification Process" - Federal Aviation Administration, Southwest Region, Annual Designee Conference

February 4-5, 1999 - "The Changing FAA Regulations" - Pacific Aircraft Maintenance Engineers Association (Canada) Symposium

May, 1997 - "Managing the Parts Manufacturer Approval Process" Federal Aviation Administration, Southwest Region, Annual Designee Conference

February 3-4, 1994 (Vancouver) "The PMA Process and the Unapproved Parts Problem" - Pacific Aviation Maintence Engineers Symposium, Transport Canada

October 26-27, 1994 (Toronto) The PMA Process and the Unapproved Parts Problem" Ontario Aviation Maintenance Engineers Workshop, Transport Canada

"Accelerated Ring/Barrel wear in Aircraft Cylinders Honed with Silicon Carbide Slurry" Aviation Maintenance Engineers Workshop, Transport Canada

"The FAA Program for 'Fast Track' PMA Authority" - Federal Aviation Administration, Southwest Region, Annual Designee Conference

March 27-29, 2000 "Economic Considerations of PMA Parts" Gorham Advanced Materials, Inc. PMA Conscience

Footnotes

1 Mission statement and historical background material can be found at the FAA website, www.faa.gov

2 Notice of Proposed Rulemaking 69-36, Federal Register, August 20, 1969

3 The FARs are codified in CFR, 14

4 Design approval under a license agreement with a, holder of a type certificate is regarded as a form of Identicality.

5 FAA Policy No. PS-ANE100-1998-00003 (also see § 7 of FAA Order 8110.42)

6 FAA Policy No. PS-ANB100-1998-00003

7 FAA Policy No. PS-ANE100-1998-0003

8 PMA regulations for "competitive" replacement parts came into being with the enactment of CMI Air Regulation (CAR) 1.55 on July 25, 1935. This was in response to a need for manufacturing parts for out-of-production (military surplus) aircraft/engines being used in civil aviation. In 1965, CAR 1.55 was recodified as FAR Part 21, § 21.303.

9 Definition of ICA from FAA Order 8110.54

10 Letter of James Whitlow, Deputy Chief Counsel, FAA dated December 13, 1999. The letter was written regarding British Aerospace PLC's failure to supply ICA but is generally quoted as applying to the whole issue of certificate holders attempting to avoid the requirements of § 21.50

11 FAA Policy No. PS-ANB100-1998-00003

12 This list is meant to be representative, not exhaustive, since such Information can be found in many places and by other traditional methods.

13 FAR Amendment 21-38, dated May 26, 1972

14 FAA Policy No. PS-ANE100-1998-00003

15 Quote from the 1984 and 1988 FAA COMSIS studies commissioned by the FAA.

16 Aviation Week, November 29, 2007

17 Aviation International News, May 1, 2006

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